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Ministry of Health



ندوة: مستجدات مرض فيروس ماربورغ

Webinar: Virus Marburg Disease Updates

الإدارة العامة لمكافحة عدوى المنشآت الصحية

Outlines

- An overview of Marburg Virus Disease (MVD) & its current status.
- The clinical presentation and management of MVD.
- The main required infection prevention & control measures & precautions.
- Current Global Glance & The International/ National Outbreak Response.





To Beat Your Enemy, You Need To Know About Your Enemy....

let's explore
TOGETHER

ok jaym



Overview of Marburg Virus Disease



Introduction

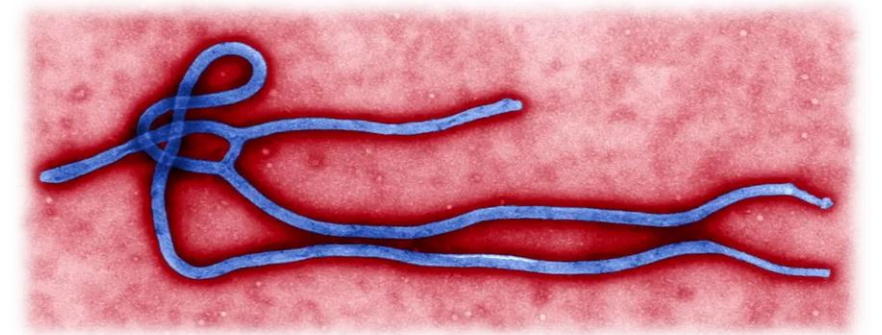
- Marburg virus disease (MVD) is a rare but severe hemorrhagic fever which affects both people and non-human primates.
- MVD is caused by the Marburg virus (MARV), a genetically unique zoonotic (or animal-borne) of the filovirus family.

60% of emerging infectious diseases that are reported globally are zoonoses.



Derivation of Name

- MARV is a member of the *Filoviridae* family, which consists of the genera *Marburgvirus*, *Ebolavirus*, *Cuevavirus*, *Striavirus*, and *Thamnovirus*.
- *Filoviridae*: from Latin *filum*, “thread,” referring to the morphology of filovirus particles.



- Viruses in the family *Filoviridae* can cause severe hemorrhagic fever in people and nonhuman primates (such as monkeys and gorillas) and may spread in other animals, such as bats.
- Filoviruses are enveloped in a lipid (fatty) membrane and appear in several shapes.

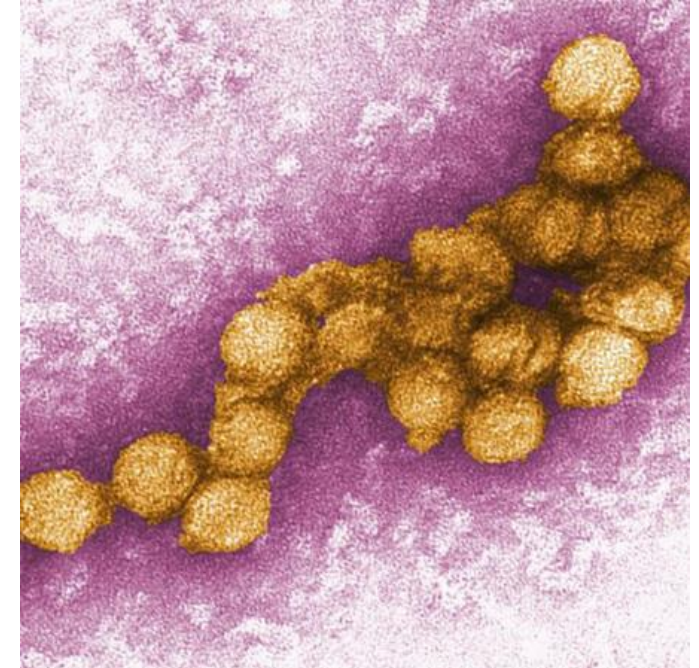
Filoviruses are zoonotic, meaning they are transmitted from animals to people. The reservoir host of Marburg virus is the African fruit bat, but further study is needed to determine if other species may also serve as hosts.



Discovery of Filoviruses

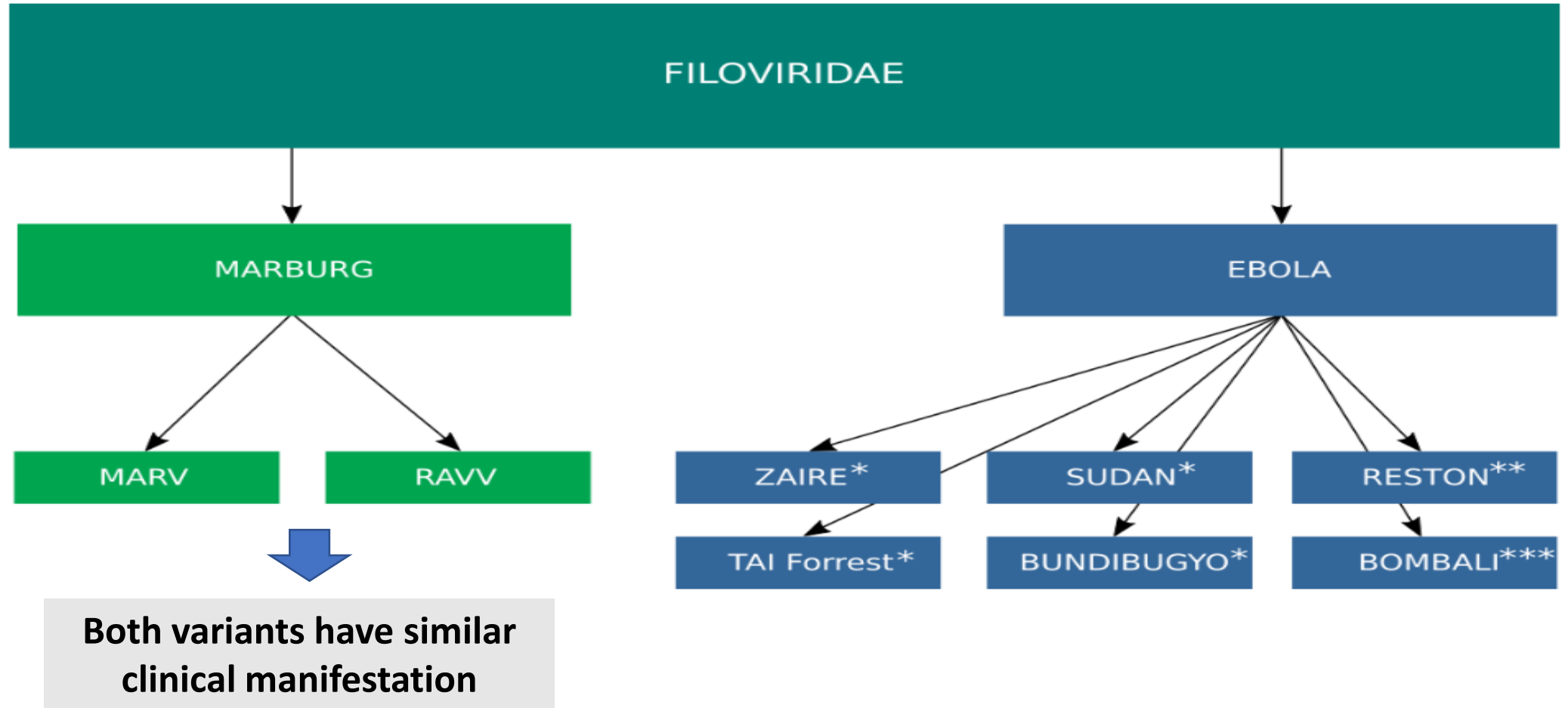
<https://ictv.global/report/chapter/filoviridae/filoviridae>

The International Committee on Taxonomy of
Viruses (ICTV)





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- Members of the family Filoviridae produce variously shaped linear non-segmented, **negative sense RNA genomes**. The family currently includes five genera.



History & Background of the MARV

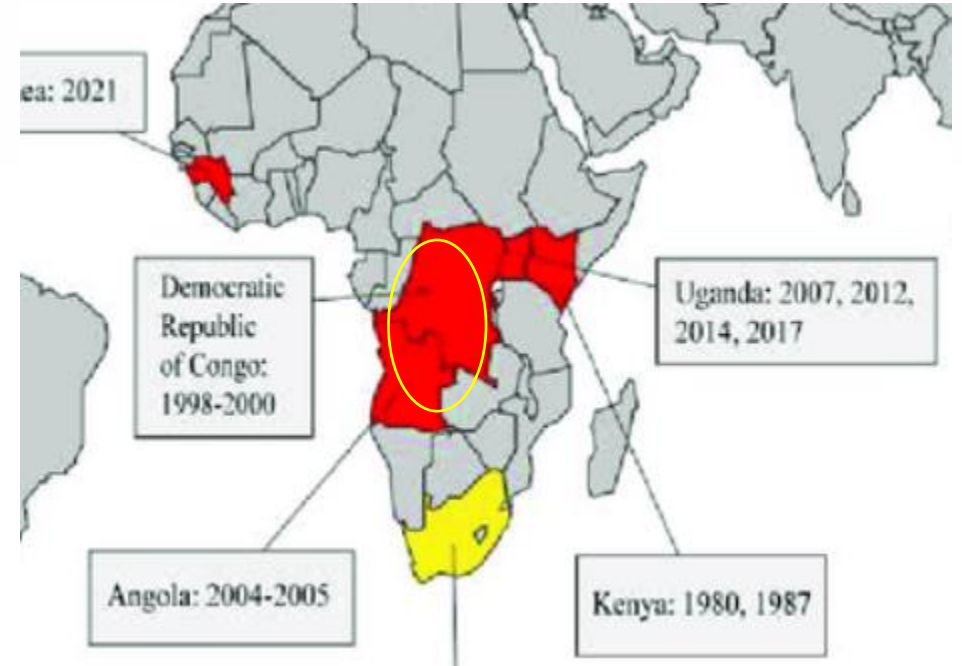
- **1967:** MARV was the first filovirus discovered following outbreaks in Germany and Yugoslavia (now Serbia) = 7 Deaths.

Among laboratory workers working with tissues of African green monkeys imported from Uganda, as well as among medical personnel who cared for the laboratory workers.

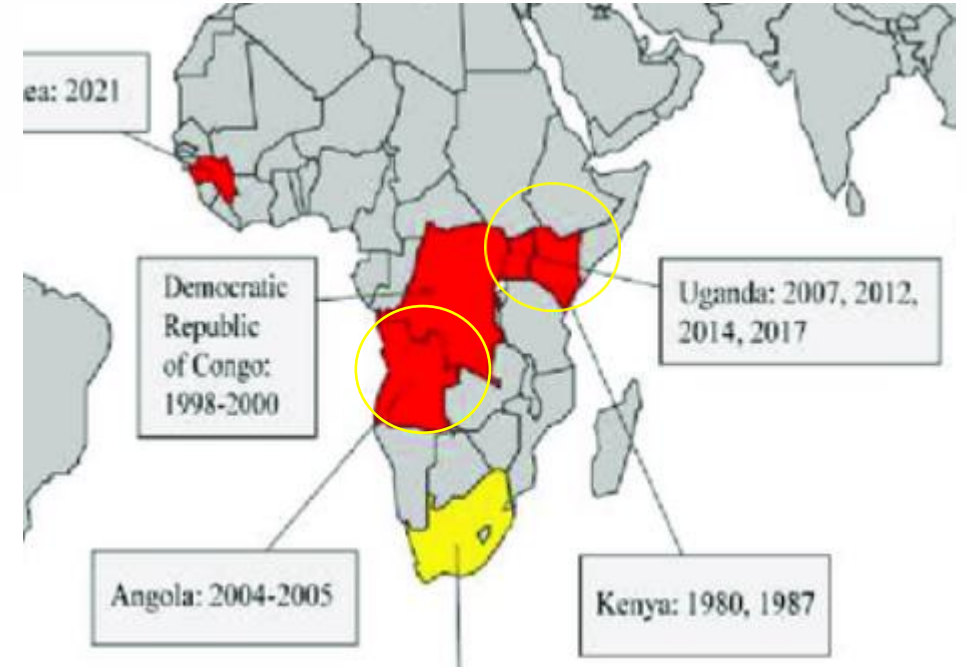


- **1998-2000: The first large outbreak**
in the Democratic Republic of the
Congo (DRC)= 128 deaths (case
fatality rate 83%)

*Most cases occurred in young male
workers at a gold mine*



- **2004 to 2005:** **The largest outbreak** to date, in Uige Province, Angola resulted in 329 deaths (case fatality rate 90%)
Pediatric Ward – contaminated equipment.
- **2012- 2014- 2017:** in Uganda and the death cases range from 1-4 cases.



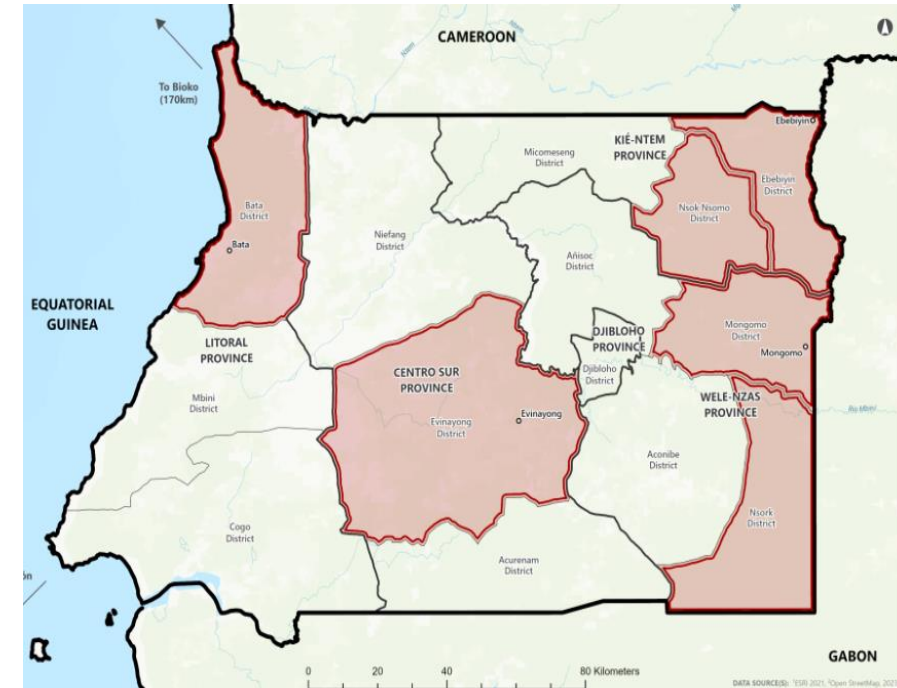
Glance At The Current Outbreak



Equatorial Guinea Outbreak Update

- On February 13, 2023, government officials in Equatorial Guinea declared a Marburg outbreak= 9 deaths.

The first MVD outbreak in the country





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Tanzania Outbreak Update

- On March 21, 2023, Tanzania government officials declared the country's first ever outbreak of Marburg= 5 deaths.

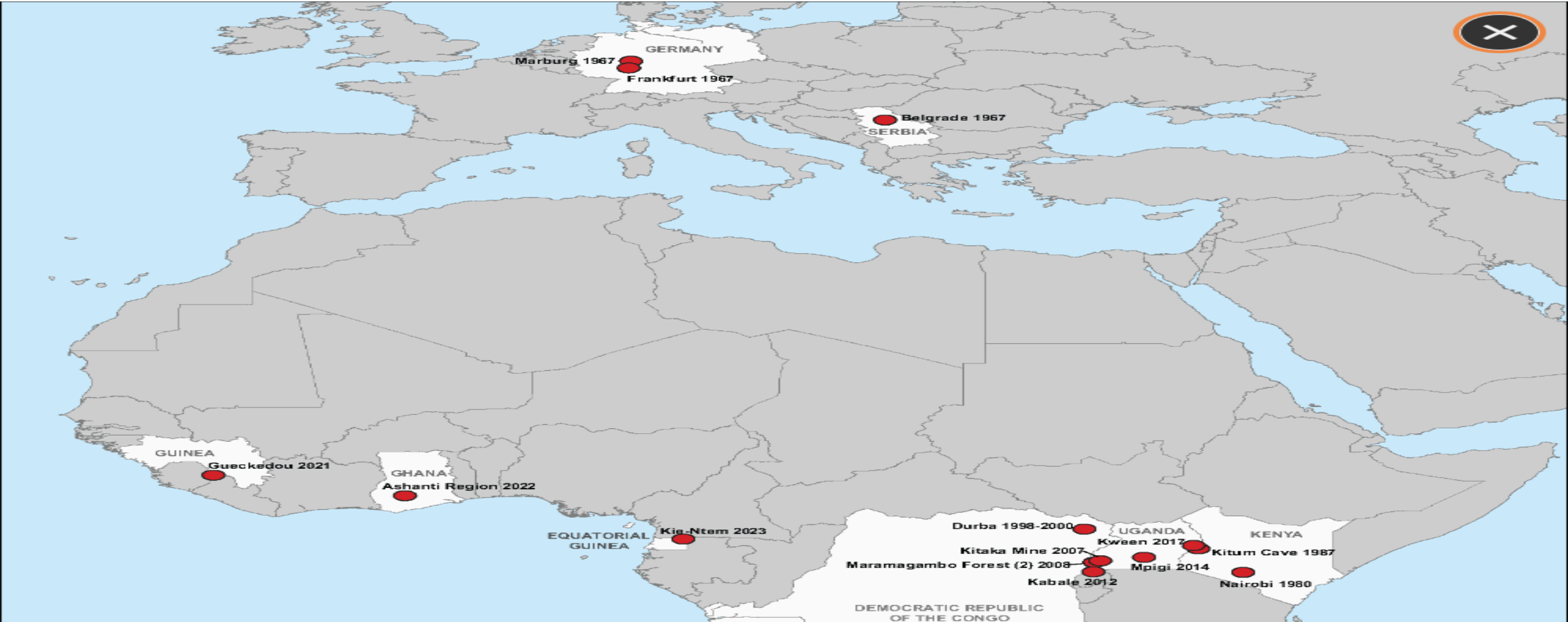
February 23, 2023 Source: [Centers for Disease Control and Prevention](#), [National Center for Emerging and Zoonotic Infectious Diseases \(NCEZID\)](#), [Division of High-Consequence Pathogens and Pathology \(DHCPP\)](#), [Viral Special Pathogens Branch \(VSPB\)](#)



Marburg in Tanzania

Warning - Level 3, Avoid Nonessential Travel
Alert - Level 2, Practice Enhanced Precautions
Watch - Level 1, Practice Usual Precautions





<https://www.cdc.gov/vhf/marburg/outbreaks/distribution-map.html>

Marburg Disease Distribution Map



The Reservoir Host

- The reservoir host of Marburg virus is a type of fruit bat native to Africa called the Egyptian rousette bat, or *Rousettus aegyptiacus* (bats or bats' bodily fluid).



- ☐ Bats infected with Marburg virus do not show obvious signs of illness
- ☐ Further studies are needed to determine if other species may also host the virus.



Case Definition

Suspected Case

Illness in a person who has both consistent symptoms and risk factors as follows:

- **Clinical criteria**, which includes fever of greater than 38.6°C, and additional symptoms such as severe headache, muscle pain, vomiting, diarrhoea, abdominal pain, or unexplained haemorrhage (gingival, nasal, cutaneous [petechiae, bruises, ecchymosis], gastrointestinal, rectal [gross or occult blood],

AND

- **Epidemiologic risk factors** within 21 days before the onset of symptoms, such as: contact with blood or other body fluids of a patient known to have or suspected to have Marburg; residence in or travel to an area where Marburg transmission is active; or direct handling of dead or alive fruit bats, monkeys, chimpanzees, gorillas, forest antelope and porcupines from disease-endemic areas.



Confirmed Case

A suspected case with laboratory-confirmed diagnostic evidence of Marburg virus infection.



Mode of Transmission

It is unknown how Marburg virus first spreads from its animal host to people;

Primary Transmission

- Human are mostly infected by handling dead or living infected animals, direct and indirect contact with bats
- Most cases are recorded in those who spent significant time in caves containing bats.



Secondary Transmission:

- ✓ Direct contact with blood secretions, organs, or other bodily fluids of infected persons.
- ✓ Direct contact with surfaces and materials (*e.g., bedding, clothing*) contaminated with bodily fluids (*such as blood, feces, vomit*).



- After this initial crossover of virus from host animal to people, transmission occurs through person-to-person contact. The virus spreads through contact (such as through broken skin or mucous membranes in the eyes, nose, or mouth).

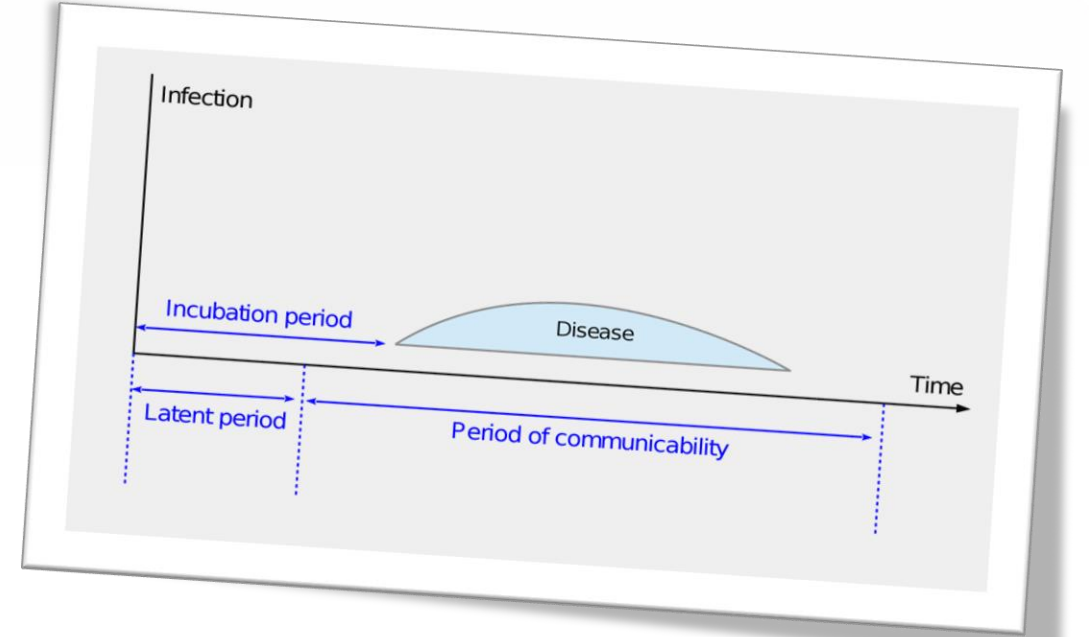


Manifestations and Management of the Disease



Incubation Period

- (2 – 21) days.
- The average is typically (5 to 10) days.





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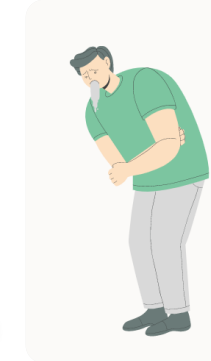
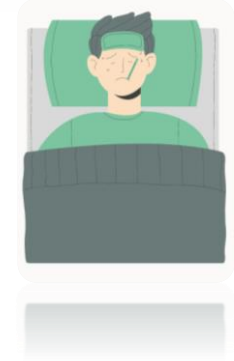
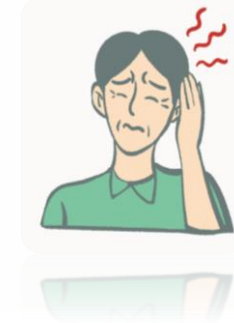
Signs and Symptoms



**General Phase
(1-5 DAYS)**

- Fever subjective or recorded $> 38^{\circ}\text{C}$.
- Severe headache.
- Severe malaise.
- Muscle aches and pains.
- Chills.
- Severe watery diarrhoea.
- Abdominal pain and cramping.
- Nausea and vomiting.
- Rash/ enanthem.

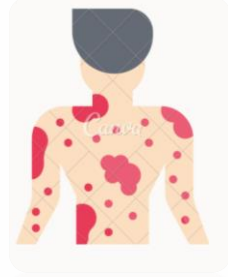
Described as "ghost-like" drawn features, deep-set eyes, expressionless faces, and extreme lethargy.





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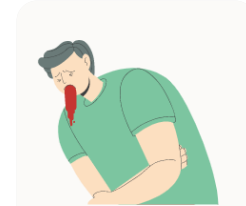
Signs and Symptoms



Early Organ Phase (6-13 DAYS)

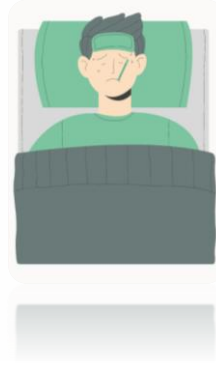
- Fever sustained.
- Bloody diarrhoea/
Melena.
- Hematemesis.
- **Petechiae**
- **Ecchymosis**
- Mucosal
haemorrhage.
- Visceral
haemorrhage.
- Conjunctival
injection.
- Edema.
- Apathy/
depression.

*Described as the
"bleeding phase".*

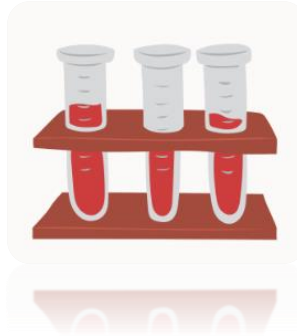




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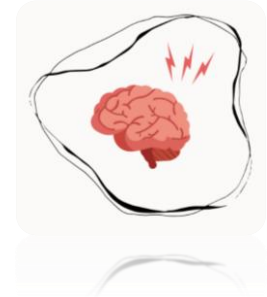
Signs and Symptoms



Late Organ Phase (14-21 DAYS)

- Fever sustained.
- Obtundation.
- Dementia.
- Coma.
- Convulsions.
- Diffuse coagulopathy/ DIC.
- Metabolic disturbance.
- Shock.
- Some report Orchitis.
- Psychosis.

Described as "CNS involvements".



Physical Examination

- ✓ A full physical examination should be undertaken with the aim of excluding a clear alternative diagnosis while looking for signs of viral haemorrhagic fever (e.g., conjunctival injection, purpuric rash, or other signs of bleeding).
- ✓ Note that Marburg virus disease is a multi-phase illness first presenting with fever and non-specific symptoms, and later progressing to include febrile gastrointestinal symptoms.
- ✓ It is important to note that not all patients will have signs or symptoms of bleeding or coagulopathy.



- **Vital signs should be taken:**

- ✓ **Fever:** the presenting symptom in most patients, its presence is enough to raise concern for infection in the appropriate epidemiological context. Wide variations in body temperature can be observed during the course of illness with normothermia or hypothermia occurring in the later stages of fatal infection. High fever ($>40^{\circ}\text{C}$ [104°F]) is common.
- ✓ **Blood pressure:** hypotension is a feature of dehydration and shock and is present in later-stage disease.
- ✓ **Pulse rate:** bradycardia may be present in the initial stages of illness; however, tachycardia may be seen in the later stages of infection.
- ✓ **Respiratory rate:** tachypnoea may be present in later stages of illness, resulting from metabolic acidosis.



Post-mortem Examinations

- ✓ The coordinator and/or the IPC staff should be consulted for any decision making on post-mortem examinations.
- ✓ Post-mortem examination of HF patient remains **should be limited to essential evaluations only** and
- ✓ should be performed by trained personnel.
- ✓ Personnel examining remains should wear **full set of PPE**.
- ✓ In addition, personnel **performing autopsies** of known or suspected HF patients should wear a particulate respirator (e.g., **NIOSH-certified N95**) or a PAPR.
- ✓ When removing PPE, **avoid any contact between soiled gloves or equipment and the face** (i.e. eyes, nose or mouth)
- ✓ **Hand hygiene** should be performed immediately following the removal of PPE.



- ✓ Place specimens in **clearly-labelled, non-glass, leak-proof containers** and deliver directly to designated specimen handling areas.
- ✓ All external surfaces of specimen containers should be thoroughly disinfected (using an **effective disinfectant**) prior to transport.
- ✓ Tissue or body fluids for disposal should be **carefully placed in clearly marked, sealed containers** for incineration.



Managing Exposure to Virus Through Body Fluids Including Blood

- ✓ Persons including HCWs with percutaneous or muco-cutaneous exposure to blood, body fluids, secretions, or excretions from a patient with suspected or confirmed HF **should immediately and safely stop any current tasks, leave the patient care area, and safely remove PPE.**
- ✓ **Remove PPE carefully** according to the protocol.
- ✓ Immediately after leaving the patient care area, **wash the affected skin surfaces or the percutaneous injury site with soap and water.**
- ✓ Accordingly, **irrigate mucous membranes (e.g. conjunctiva) with copious amounts of water or an eyewash solution,** and not with chlorine solutions or other disinfectants.



- ✓ Immediately **report the incident** to the local coordinator.
- ✓ This is **a time-sensitive task** and should be performed as soon as the HCW leaves the patient care unit.
- ✓ Exposed persons should be **medically evaluated including for other potential exposures** (e.g., HIV, HCV) and **receive follow-up care**, including fever monitoring, **twice daily for 21 days after the incident.**



- ✓ Immediate consultation with an expert in infectious diseases is recommended for any exposed person who **develops fever within 21 days of exposure**.
- ✓ People **suspected** of being infected should **be cared for/isolated**, and the same recommendations outlined until a **negative diagnosis is confirmed**.
- ✓ **Contact tracing** and follow-up of family, friends, co-workers and other patients, who may have been exposed to virus through close contact with the infected health workers **is essential**.



Required Test/ Investigation

- ✓ Early detection and diagnosis of MVD **can be challenging** as the early signs and symptoms of MVD are **non-specific and difficult to distinguish from other infectious diseases**, such as malaria, typhoid fever, shigellosis, meningitis, and other viral hemorrhagic fevers, (e.g., Lassa fever or Ebola).
- ✓ The consequent delay in diagnosis **can therefore hinder survival chances and create challenges in controlling transmission and outbreak.**
- ✓ Marburg virus is commonly suspected in those who have been **exposed to geographic areas** where Marburg virus is common, particularly in individuals with a known exposure.
- ✓ During the early stages of MVD, detection of the virus can be made through **throat and nasal swabs, cerebrospinal fluid samples, urine samples, and/or blood samples.**
- ✓ Samples collected from individuals with MVD are a **biological hazard** and should be handled and tested under maximum biological containment conditions.



- These samples can be analyzed through enzyme-linked immunosorbent assay (i.e., **ELISA**) testing,
- reverse transcriptase polymerase chain reaction (**RT-PCR**),
- and **IgM-capture ELISA** to detect antibodies, antigens, and proteins specific to Marburg virus.
- **Virus isolation** may also be performed but should only be done in a high containment laboratory with good laboratory practices.



Other Investigations

- ✓ Renal function and serum electrolytes
- ✓ Blood lactate
- ✓ ABG
- ✓ Coagulation studies
- ✓ LFTs
- ✓ Serum amylase
- ✓ Blood cultures
- ✓ CBC



Diagnosis

- ✓ For a patient that meets the clinical criteria and epidemiologic risk factors, Ebola/Marburg virus is detected in blood only after the onset of symptoms and It may take up to 3 days for the virus to be detectable in clinical samples .
- ✓ Therefore, if a test result is negative for samples collected less than 3 days of the onset of symptoms, a later specimen should be collected after 48 hours.
- ✓ Collect two samples with a minimum volume of 4 millilitres of whole blood in EDTA blood collection tubes.
- ✓ For paediatric, a minimum of 1 mL whole blood should be collected.



How is Marburg Virus Infection Treated?



- ✓ Treatment of Marburg virus infection is limited to **supportive care**, typically after hospitalization, which includes rest, hydration, oxygen, and treatment of specific symptoms upon onset.
- ✓ Intravenous and/or oral **fluids** may be provided to replace lost fluids, stabilize electrolytes, and maintain blood pressure.
- ✓ **Blood transfusions** may also be provided to replace lost blood and clotting factors.
- ✓ If other complicated infections develop, **appropriate antiviral and/or antibiotic therapies may be indicated**.
- ✓ While there are not currently any approved drug treatments for Marburg virus infection, immunotherapeutic treatments known as **monoclonal antibody therapies** are currently under development and evaluation for treatment of MVD.
- ✓ **Antiviral therapies**, have been used in clinical studies for Ebola that may also be tested for use in MVD.





Treatment & Vaccines

- ✓ Currently, there are **no vaccines licensed to protect against Marburg virus infection.**
- ✓ Clinical **trials are ongoing** for a number of other vaccine candidates.
- ✓ In May 2020, the EMA granted a marketing authorisation to **Zabdeno** (Ad26.ZEBOV) and **Mvabea** (MVA-BN-Filo) against EVD .
- ✓ The Mvabea contains a virus has been modified to produce 4 proteins from **Zaire ebolavirus** and three other viruses of the same group (filoviridae).
- ✓ The vaccine could potentially protect against MVD, **but its efficacy has not been proven in clinical trials.**



Marburg Viral Persistence in People Recovering from Marburg Virus Disease

- ✓ Marburg virus is known to **persist in immune-privileged sites in some people who have recovered from Marburg virus disease**. These sites include the **testicles and the inside of the eye**.
- ✓ In women who have been infected while pregnant, the virus persists in the **placenta, amniotic fluid and foetus**.
- ✓ In women who have been infected while breastfeeding, the virus may persist in **breast milk**.
- ✓ **Relapse-symptomatic illness in the absence of re-infection in someone who has recovered from MVD is a rare event, but has been documented**. Reasons for this phenomenon are not yet fully understood.



- ✓ Marburg virus transmission via infected semen has been documented up **after clinical recovery**.
- ✓ Transmission by sexual contact has been documented in Ebola and male survivors are recommended to **practise safe sex for at least 12 months after clinical recovery** according to WHO, unless their semen has tested negative on two separate occasions.
- ✓ More surveillance data and research are needed on the risks of sexual transmission, and particularly on the prevalence of viable and transmissible virus in semen over time.

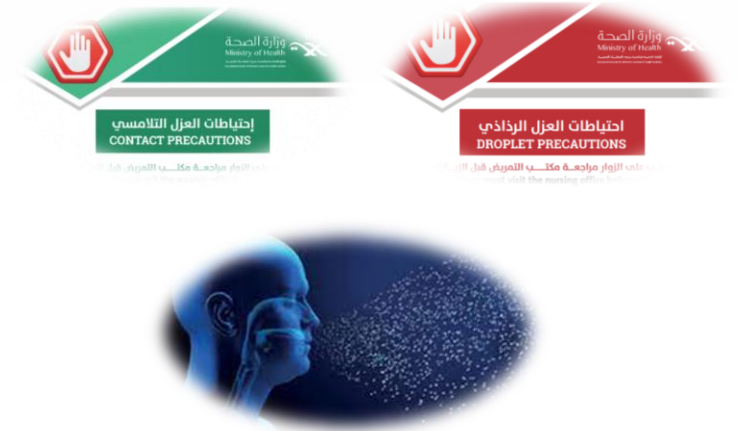


Infection Prevention & Control Measures



Patient Placement & Isolation

- Suspected/ confirmed cases should be under **Contact and Droplet** precautions in addition to the **Standard Precaution**.
- Airborne precautions should be taken in case of *aerosol-generating procedures(AGPs)*.



What are the aerosol-generating procedures(AGPs)?



Patient Placement & Isolation

- Suspected and confirmed cases should be isolated in a single room with a designated toilet and hand-washing facility (*door should be closed all the time*)

No need for an airborne infection isolation room(AIIR)



Personal Protective Equipment (PPE)

- Healthcare workers caring for patients with suspected or confirmed Marburg virus should apply extra infection control measures to prevent contact with the patient's blood and body fluids and contaminated surfaces or materials such as clothing and bedding.



There should be a dedicated team trained and competent in all infection prevention & control measures in dealing with MVD



Personal Protective Equipment (PPE)

1. **Fluid-resistant gown** (*extends to at least mid-calf*) or **fluid-resistant coveralls** *gowns should be used in addition to head covers.*



2. **Full face shields.**



3. **Mask/respiratory protection.**



In AGPs, fitted N95 respirator is required or Powered air purifying respirator (PAPR)



Personal Protective Equipment (PPE)

4. **Gloves:** *with extended cuffs. (Two pairs of gloves should be worn. At a minimum, outer gloves should have extended cuffs.)* to cover the cuffs of gowns/coveralls.
5. **Rubber boots:** *rubber boots should be used if available. If not, the shoes should be completely sealed and non-slippery.*



Personal Protective Equipment (PPE)

Before Putting on PPE

- ✓ Some practical precautions to take during patient care include ***no touching of the eye protection or mask and keeping hands away from the face, limiting the touching of surfaces and body fluids as much as possible, no leaning against walls, no kneeling down, no sitting.***
- ✓ PPE should never be adjusted during patient care. If a partial or total breach in PPE occurs (*e.g., gloves separate from sleeves exposing skin, or a needlestick injury occurs*), the healthcare worker must leave the patient care zone **immediately.**



Personal Protective Equipment (PPE)

Inspection and Buddy System:

- ✓ PPE donning and doffing are done in *presence of another provider to help inspect/confirm* proper donning and doffing, and to help in the process as well.
- ✓ Inspection is important when donning and doffing to check the PPEs that are free of defects such as holes.



Personal Protective Equipment (PPE)

Steps of Donning PPE:

- 1) Remove personal belongings.
- 2) Medical scrubs should be worn under a coverall or gown.
- 3) Rubber boots should be donned.
- 4) Don coverall and zip it all the way up, and ensure the hood is on the outside. A plastic apron can be used as well.
- 5) Impermeable, fluid-resistance gown can be used instead of a coverall.
- 6) Put on a medical mask followed by a face shield or eye protection.



Personal Protective Equipment (PPE)

Steps of Donning PPE:

- 7) Pull the coverall hood to cover the head. A surgical cap can be worn as well.
- 8) Put on the first pair of gloves and ensure it's under the cuff of the coverall/gown.
- 9) Put on outer pair of long gloves that covers the cuff of the coverall.



Personal Protective Equipment (PPE)

Steps of Doffing PPE:

- 1) Inspect PPEs and *disinfect outer gloves* with approved MOH disinfectant.
- 2) Remove the outer gloves and ensure not to contaminate the surface of the inner gloves. *Disinfect inner gloves.*
- 3) Lower the hood with a back rolling motion and ensure not to touch the face. *Disinfect inner gloves.*
- 4) Tilt the head back a little to reach the zipper and fully unzip the suit. *Disinfect inner gloves.*



Personal Protective Equipment (PPE)

Steps Of Doffing PPE:

- 5) Roll down the coverall while turning inside out. **With touching only, the inside of the coverall, avoid contact with skin or scrub.** Dispose of the gown or coverall in a designated leak-proof bag. *Disinfect inner gloves.*
- 6) While leaning forward, gently remove the face shield by gripping the sides and pulling away to discard. *Disinfect inner gloves.*
- 7) Remove the mask by grasping the outer surface with one hand and the other to pull the straps away. *Disinfect inner gloves.*

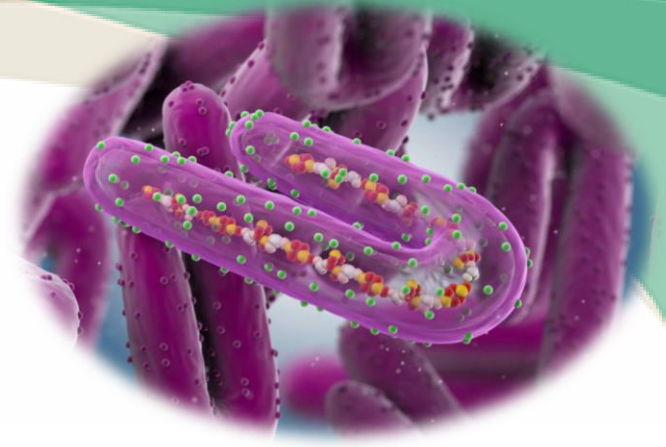


Personal Protective Equipment (PPE)

Steps of Doffing PPE:

- 8) Remove the boot cover. *Disinfect inner gloves.*
- 9) Remove and discard gloves, taking care not to contaminate bare hands during the removal process.
- 10) Perform hand hygiene.

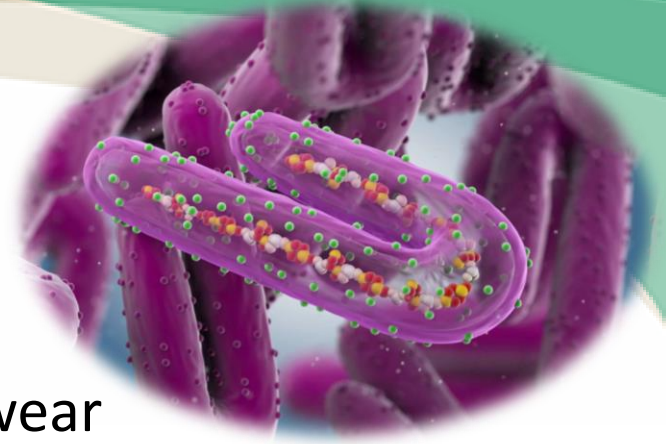




Environmental Cleaning & Disinfection

- ✓ Filoviruses can survive in liquid or dried material for many days.
- ✓ They are inactivated by *gamma irradiation, sodium hypochlorite, and other intermediate-level disinfectants* (<https://gdipc.sa/Supportive-Services-Program.html>)
- ✓ Diligent environmental cleaning and disinfection and safe handling of potentially contaminated materials are paramount, as blood, sweat, emesis, feces, and other body secretions represent potentially infectious materials.



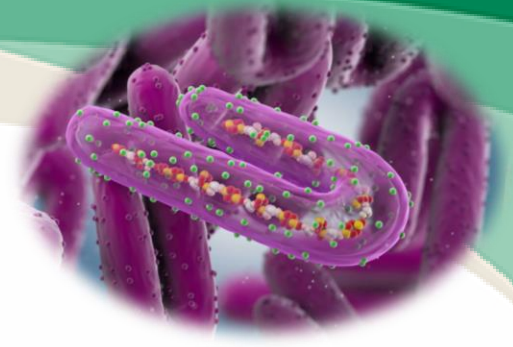


Environmental Cleaning & Disinfection

- ✓ HCWs performing environmental cleaning and disinfection should wear recommended PPE and consider the use of additional barriers (*shoe and leg coverings, etc.*) if needed.
- ✓ Environmental surfaces or objects contaminated with blood, other body fluids, secretions, or excretions should be cleaned and disinfected *as soon as possible* using approved MOH **intermediate-level disinfectants**. (*e.g., a 0.5% chlorine solution or a solution containing 5,000 ppm available free chlorine*)

Application of disinfectants should be preceded by cleaning to prevent the inactivation of disinfectants by organic matter

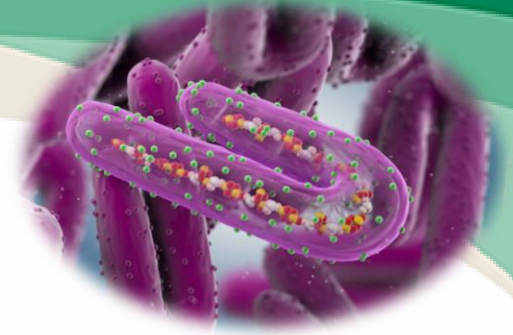




Environmental Cleaning & Disinfection

- ✓ Routine cleaning of the PPE doffing area should be performed at least once per day and after the doffing of grossly contaminated PPE or when needed.

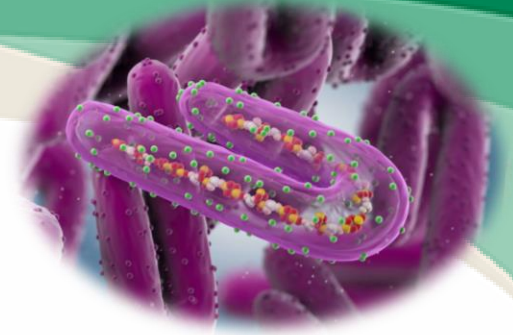




Wastes Management

- ✓ Waste should be placed in *double, leak-proof bags, and stored in rigid, leak-proof containers.*
- ✓ Safe containment and packaging of waste should be performed as close as possible to the point of generation.
- ✓ Staff should avoid opening containers or manipulating the waste.
- ✓ Use (PPE) for handling waste until performing the on-site inactivation or transporting the waste away to the offsite inactivation area.
- ✓ The healthcare workers should immediately spray or wipe the outside surfaces of double-bagged waste with an approved MOH disinfectant before removing waste from the room.

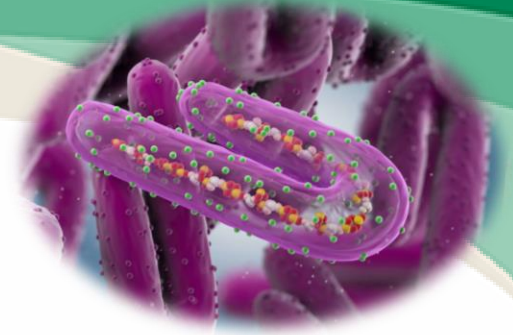




Management of the Deceased

- ☐ Only personnel trained and competent is assigned in handling the body of a person who has died from Marburg.
- ☐ When handling the body of a person who has died from Ebola/ Marburg:
 - ✓ *Do not wash or clean the body.*
 - ✓ *Do not perform an autopsy unless it is necessary.*
 - ✓ *Do not remove any inserted medical equipment from the body such as intravenous (IV) lines, endotracheal or another tubing, or implanted electronic medical devices.*
- ☐ HCWs dealing with the body should wear all PPEs.





Management of the Deceased

- Body of a suspected or confirmed case of Marburg must be placed in a double-body bag.
- Place the body in the first body bag.
- Wipe over the surface of the first body bag using a hospital-approved disinfectant and seal it.
- Place the body in the second body bag.
- Wipe over the surface of the second body bag using a hospital-approved disinfectant and seal it.
- Label with the indication of highly infectious material.
- Immediately move the body to the mortuary or the cemetery. *(Follow the policy for Emergency Medical Services (EMS) Infection control guidelines)*



Specifications of Body Bags

- ✓ Impermeable, vinyl, the minimum thickness of 400 microns.
- ✓ Should be able to hold 100-125 kilos (200-250 lbs.).
- ✓ At least 4 handles are included in the body bag to allow safe hand carries.
- ✓ Provide full containment of blood-borne pathogens.



Transport the Body Bag to the Cemetery

- ✓ Wear gloves to transport the body bag to the ambulance.
- ✓ Transport of the body bag should be by 2 or 4 persons (depending on the weight of the body).
- ✓ The body bag is placed (delicately) on the platform of the ambulance, (head towards the front).
- ✓ Body bag should be gently placed.
- ✓ No family member should sit in the ambulance cabin.
- ✓ The ambulance used needs to be cleaned and disinfected.



Placement of Body Bag Into the Grave

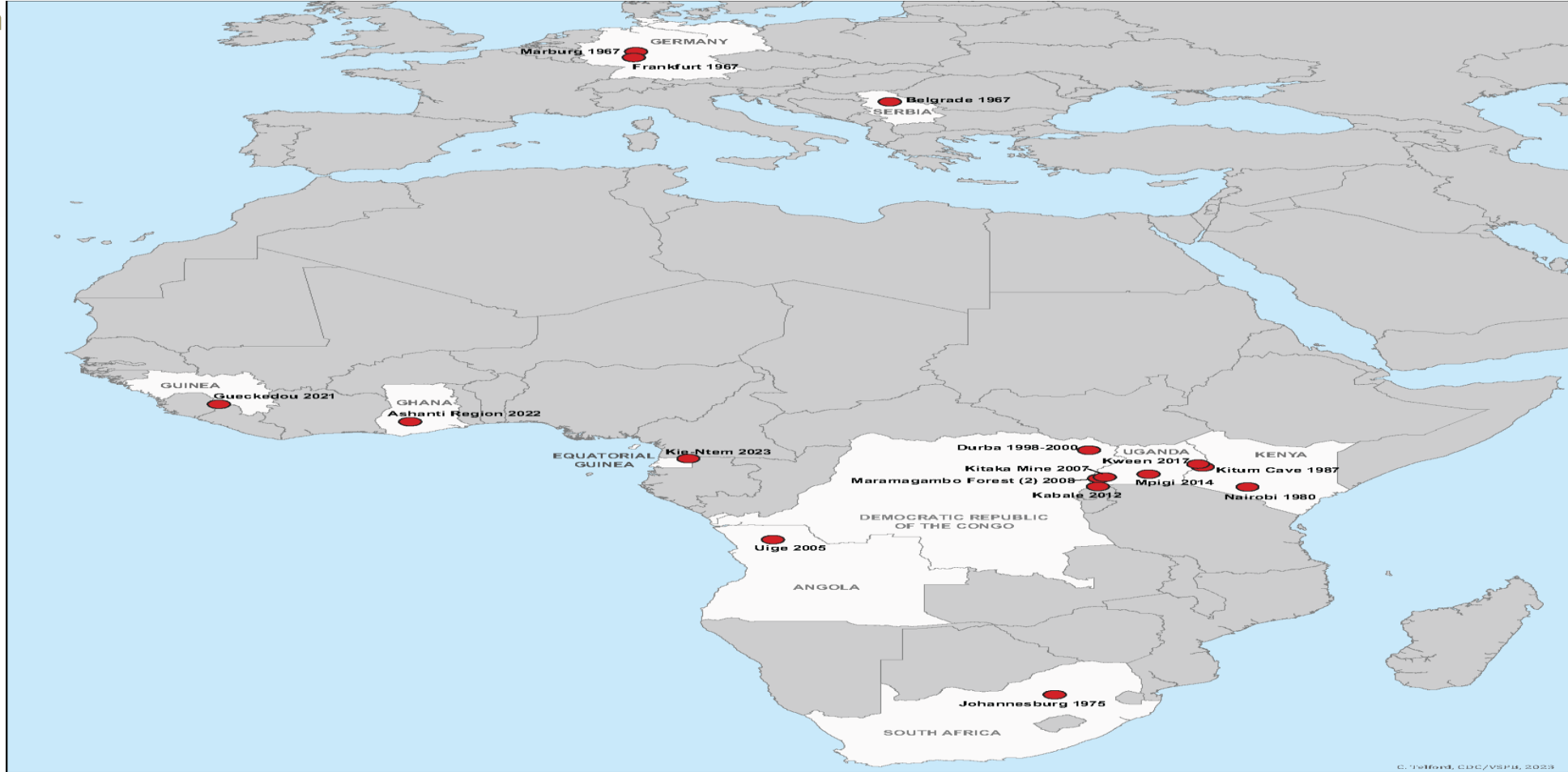
- ✓ Manually carry the body bag to the grave, by the carriers wearing gloves (*use the handles included in the body bag*).
- ✓ Slowly lower the body bag into the grave with individuals wearing gloves who stepped into the graves.
- ✓ Place the body bag into the grave.
- ✓ Place gloves in an infectious waste bag for dispose in correct way.
- ✓ The ambulance used needs to be cleaned and disinfected.



Current Global Glance & The International/ National Outbreak Response



Glance at The Situation



OUTBREAKS OF MARBURG DISEASE

● Outbreak Location and Year

0 250 500 750 mi



Last Updates of MVD in Equatorial Guinea :

- Total confirmed cases: **14**
- Suspected cases: **3**
- Deceased: **9**
- Recovered cases: **1**
- Unknown: **1**

Marburg in Equatorial Guinea

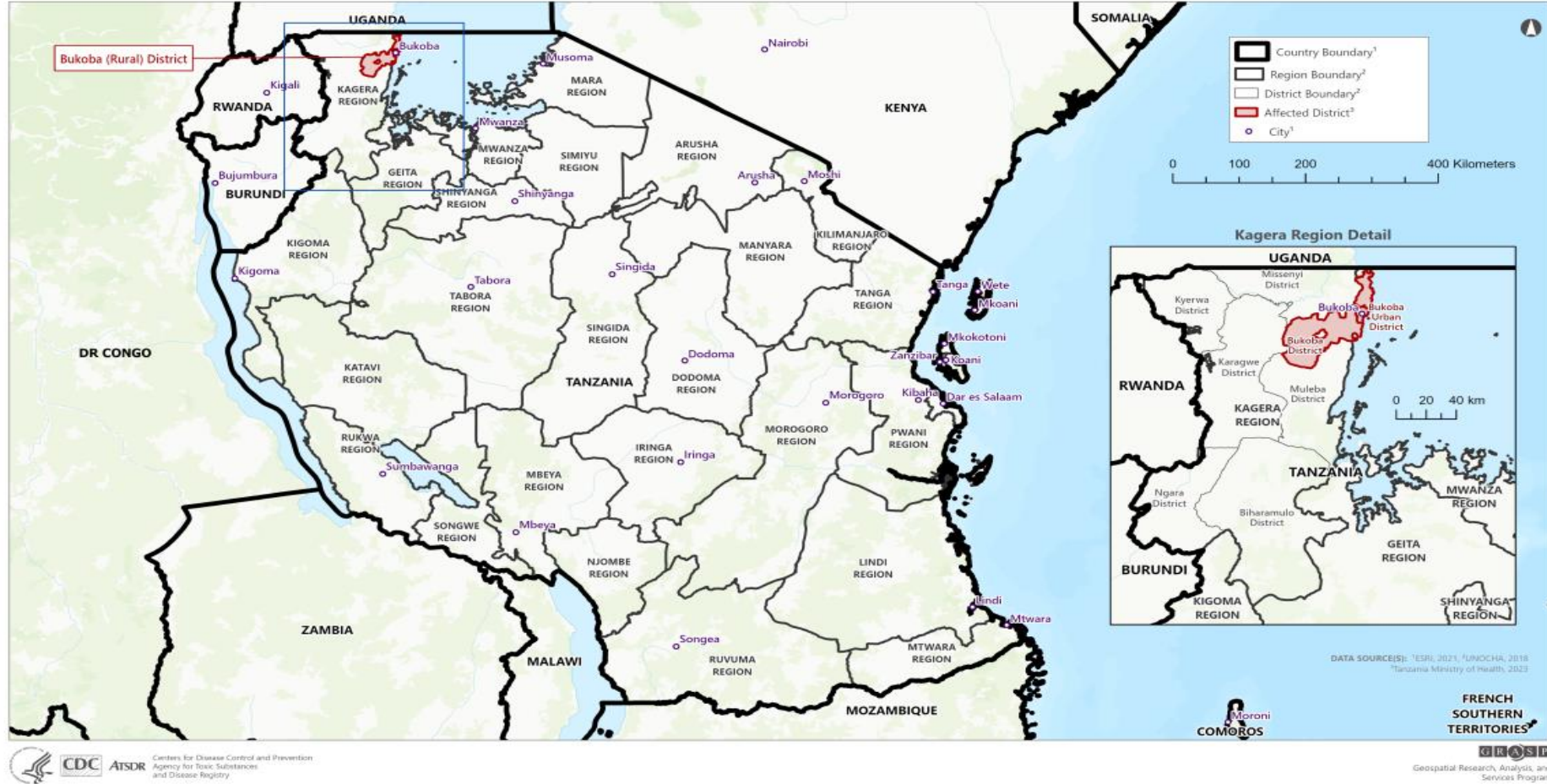
Warning - Level 3, Avoid Nonessential Travel

Alert - Level 2, Practice Enhanced Precautions

Watch - Level 1, Practice Usual Precautions



Tanzania: Marburg Virus Disease Outbreak 2023 Affected Districts



Last updates of MVD in Tanzania:

- Total confirmed cases: **8**
- Under treatment cases: **3**
- Under Monitoring (Tracing) : **161**
- Deceased: **5**

Marburg in Tanzania

Warning - Level 3, Avoid Nonessential Travel

Alert - Level 2, Practice Enhanced Precautions

Watch - Level 1, Practice Usual Precautions



WHO Response:

Marburg Virus Disease Epidemics: Preparedness, Alert, Control, and Evaluation

When an outbreak is detected WHO responds by supporting surveillance, community engagement, case management, laboratory services, contact tracing, infection control, logistical support and training and assistance with safe burial practices.



- WHO has developed detailed advice on Marburg infection prevention and control:

(Infection prevention and control guidance for care of patients with suspected or confirmed Filovirus hemorrhagic fever in health-care settings).



Public Health response

- In-depth epidemiological investigations are underway to determine the source of the outbreak.
- National teams have been deployed to the affected districts for active case finding, contact tracing, isolating and providing medical care to cases.
- WHO has deployed experts in epidemiology, case management, infection prevention, laboratory and risk communication to support national response efforts and ensure community engagement.
- WHO is also facilitating the shipment of tents, materials for sample collection and analysis, and a viral haemorrhagic fever kit including personal protective equipment for 500 health workers.
- WHO is supporting the transportation of samples to laboratories in Senegal and Gabon as plans are underway to set up laboratory facilities in-country



National level

- IHR in the MOH give the instructions to the healthcare workers working in the entry point to detect the cases from the first point.
- **On 31 March 2023,** Public Health Authority (Weqaya) has been issued a warning to travel to Equatorial Guinea and Tanzania.
- GCC warning to travel to Equatorial Guinea and Tanzania.
- IPC measures.
- Trained healthcare workers.
- Increase awareness.



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Any Questions



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